

ABSTRACT

The invention is a controller for a hybrid electric vehicle (HEV) that provides a strategy to control a split powertrain hybrid electric vehicle (HEV) when a vehicle 5 travels in reverse, battery state-of-charge (SOC) is low and the powertrain is configured to only use the motor while traveling in reverse. The powertrain reverse drive mode controller can be configured to determine whether the engine and generator motor are running, calculate a benefit power 10 from the engine if the engine and the generator motor are running, compare the benefit power with a first predetermined value, determine whether a driver torque request plus the generator torque is greater than a predetermined maximum motor torque if the benefit power is greater than or equal to the first predetermined value, calculate a new generator torque request if the determination of whether a driver torque request plus the generator torque is greater than a predetermined maximum motor torque, determine whether the new generator torque request is greater than or equal to a second 15 predetermined value, calculate a new generator speed for the new generator torque request if the new generator torque request is greater than or equal to the second predetermined value, determine whether the new generator speed is less than or equal to a maximum generator speed, and determine a new 20 motor torque request if the new generator speed is less than a maximum generator speed. The invention further provides a strategy to control a split powertrain hybrid electric vehicle (HEV) when a vehicle 25 travels in reverse, battery state-of-charge (SOC) is low and the powertrain is configured to only use the motor while traveling in reverse. The powertrain reverse drive mode controller can be configured to determine whether the engine and generator motor are running, calculate a benefit power from the engine if the engine and the generator motor are running, compare the benefit power with a first predetermined value, determine whether a driver torque request plus the generator torque is greater than a predetermined maximum motor torque if the benefit power is greater than or equal to the first predetermined value, calculate a new generator torque request if the determination of whether a driver torque request plus the generator torque is greater than a predetermined maximum motor torque, determine whether the new generator torque request is greater than or equal to a second predetermined value, calculate a new generator speed for the new generator torque request if the new generator torque request is greater than or equal to the second predetermined value, determine whether the new generator speed is less than or equal to a maximum generator speed, and determine a new motor torque request if the new generator speed is less than a maximum generator speed.

or equal to a maximum generator speed. The controller can also be configured to add a stop engine command if the benefit power is less than the first predetermined value, the new generator torque request is less than the second predetermined value, or the new generator speed is greater than a maximum generator speed.